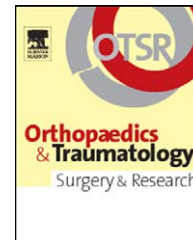




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ORIGINAL ARTICLE

Posterior arthroscopic subtalar arthrodesis: Ten cases at one-year follow-up

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KEYWORDS

Arthroscopy;
Subtalar;
Arthrodesis;
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Summary

Background: Isolated subtalar arthrodesis is the treatment of choice for several conditions—mostly subtalar arthritis, tarsal coalition and posterior tibial tendon dysfunction—unresponsive to conservative treatment. Arthroscopic procedures are an interesting recent alternative, less invasive than conventional open techniques. Posterior arthroscopy, in prone position, could be more advantageous than the conventional lateral and/or anterior approach.

Patients and methods: Ten cases, from 20 to 59-years-old, were prospectively followed up for minimum of one-year (range 12 to 31 months). Arthritis and tarsal coalition were the most common indications.

Results: Fusion was observed in all cases at a maximum of nine weeks. Mean average AOFAS score improved from 47 to 78. No complications were noted related to the technique. Only two patients, operated for a symptomatic subtalar coalition, complained of some residual pain due to a lateral submalleolar impingement. Interest of preservation of vascular talar supply and bone grafting are discussed.

Conclusion: The good results using this innovative technique are encouraging. Long-term randomized studies remain necessary to confirm the reliability of the procedure in these different indications, and the type of bone graft to favour, if really needed.

Level of evidence: Level IV therapeutic study.

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Introduction

Subtalar arthrodesis is a recommended option after failed conservative treatment of many different isolated subta-

lar conditions[1]. Primary and secondary (following talar or calcaneal fracture or subtalar dislocation) arthritis are the most common indications along with symptomatic talocalcaneal coalitions and deformities of the hind-foot.

Symptoms of pain, mostly on uneven ground, and instability are common, leading to loss of function and reduced activities.

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Standard surgical procedure includes open arthrodesis, often using bone grafting (morcelized or structural, auto- or allograft) and solid fixation, usually with one or two screws. Favourable outcomes following this procedure are reported [2–6]. Nevertheless, high rates of complications are also encountered, as recently described by Easley et al. They noticed up to 36% of non-unions. Other less frequent complications are prominent hardware, lateral impingement, malalignment and infection [1].

Since the 1980's, arthroscopy of the foot and ankle has developed, leading to less invasive but effective surgical procedures, including subtalar arthrodesis. While a few series are published about arthroscopic procedures using sinus tarsi portals [7–9], five studies report the use of a posterior approach [10–14]. This posterior approach is thought to show some technical advantages with potentially more effective results probably due to a better preservation of talar vascularisation.

We present the results of our first 10 patients treated with this innovative technique.

Patients and methods

Patients

Ten feet in 10 patients (six male and four female) were consecutively operated by the same operator (BDB) from 05/2007 to 12/2008. Four of them were smokers. Age at time of surgery varied from 32- to 59-years-old (mean 37.8-years-old).

Patients elected for the arthroscopic assisted subtalar arthrodesis were patients with isolated subtalar arthritis or talocalcaneal coalition without major hindfoot deformity, and irresponsive to conservative treatment. Vascular impairment, previous ankle or subtalar procedure, talar necrosis or the need of a combined ankle arthroscopic procedure were in favour of the arthroscopic approach as compared to open procedure. A history of local sepsis was considered as a contra indication.

Methods

Radiographic assessment included standard weight bearing X-ray of the two feet and the two ankles. Ankle alignment was evaluated according to Meary.

In our standard operative protocol patients were placed in prone position. A tourniquet was used. A 30° inclined 4 mm arthroscope was introduced through the posterior two portal approach, as described by Van Dijk et al. [15].

Posterior subtalar articular surfaces were curetted and shaved with a burr (5 mm diameter full radius shaver) up to subchondral bleeding bone, followed by microfracturing before grafting procedure. Due to the posterior approach, the main difficulty was to reach the most anteromedial aspect of the posterior articular surface. The anterior subtalar articular surfaces were not approached. We used a 6 mm percutaneous trocar to harvest iliac bone autograft (about 5 by 15 to 20 mm) and blood cells in eight cases. Graft was introduced by the posteromedial approach using an arthroscopic grasping forceps and was impacted. One graft was from an intra-articular nodule and one case was treated

without any graft. Although remaining matter of debate, we used autograft, based on the assumption that bone and bone cells would help to fusion. Finally two 4 or 6.5 mm Unima (EOS – France) cannulated screws were placed under fluoroscopic control, from the posterior tuberosity of the calcaneus to the talar body.

Mean operative time was 124 minutes (range: 100–162).

A period of six weeks non weight bearing immobilisation was recommended to all patients, followed by a period of progressive weight bearing with the use of a removable walking cast until pain resolution. Careful ankle mobilisation was encouraged from the 21th postoperative day.

The American Orthopaedic Foot and Ankle Society (AOFAS) scores were compared for all patients, preoperatively and at final follow-up [16]. Postoperative score of 94 out of 100 points was considered as the maximum possible, as six points are assigned to subtalar mobility.

Radiographic fusion was defined by the evident presence of bridging callus or osseous trabeculation at the union site observed on standard non weight bearing X-ray [1, 10].

Results

Average postoperative hospital stay was 2.9 days. None of the patients was lost to follow-up. Average follow-up was 21.5 months (range from 12 to 31 months).

Radiographic results

Fusion occurred in all patients, at a mean of 6.8 weeks (range from six to nine weeks) (Fig. 1). Fusion time in the four patients with an active smoking history was not longer. Preoperative hindfoot alignment was preserved in all cases.

Functional results

Average AOFAS score improved from 47 (range from 22 to 65) to 78 (range from 60 to 91). All but one patient were satisfied or very satisfied. One less favourable score was associated to painful arthritic lesions in midfoot joints following previous tarsal fracture dislocation (Patient 7, Table 1). A second patient had been operated of ankle arthrodesis on the other side (Patient 5, Table 1).

Complications

We observed no nerve lesion, no sepsis and no non-union. Excluding a limited haematoma in a haemophilic patient we observed no complications at the iliac crest.

Unfortunately, the two patients operated for tarsal coalition presented with lateral submalleolar impingement (Patients 4 and 10, Table 1) (Fig. 2). One was treated with orthopaedic insoles, and the second underwent a limited resection of the calcaneal external edge. (Table 1).

Discussion

Arthroscopic subtalar arthrodesis gained some interest in the past ten years thanks to the good outcomes associated to

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